

<110> Altmann, Scott W

Graziano, Michael

<120> NPC1L1 (NPC3) AND METHODS OF USE THEREOF

<160> 50

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<212> DNA

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<221> CDS

<222> (1) .. (3996)

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1 5 10 15

gcg gcc cag ggt gag cta tac aca ccc aaa cac gaa gct ggg gtc tgc 96  
Ala Ala Gln Gly Glu Leu Tyr Thr Pro Lys His Glu Ala Gly Val Cys  
20 25 30

acc ttt tac gaa gag tgc ggg aaa aac cca gag ctc tct gga ggc ctc 144  
Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu

35	40	45	
acg tca cta tcc aat gta tcc tgc ctg tct aac acc ccg gcc cgc cac Thr Ser Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg His 50 55 60			192
gtc acg ggt gaa cac ctg gct ctt ctc cag cgc atc tgt ccc cgc ctg Val Thr Gly Glu His Leu Ala Leu Leu Gln Arg Ile Cys Pro Arg Leu 65 70 75 80			240
tac aac ggc ccc aat acc act ttt gcc tgt tgc tct acc aag cag ctg Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu 85 90 95			288
ctg tcc tta gaa agc agc atg tcc atc acc aag gcc ctt ctc acg cgc Leu Ser Leu Glu Ser Ser Met Ser Ile Thr Lys Ala Leu Leu Thr Arg 100 105 110			336
tgc ccg gcc tgc tct gac aat ttt gtg agc tta cac tgc cac aac act Cys Pro Ala Cys Ser Asp Asn Phe Val Ser Leu His Cys His Asn Thr 115 120 125			384
tgc agc cct gac cag agc ctc ttc atc aac gtc acc cgg gtg gtt gag Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Glu 130 135 140			432
cgg ggc gct gga gag cct cct gcc gtg gtg gcc tat gag gcc ttt tat Arg Gly Ala Gly Glu Pro Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr 145 150 155 160			480
cag cgc agc ttt gct gag aag gcc tat gag tcc tgc agc cag gtg cgc Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Gln Val Arg 165 170 175			528
atc cct gcg gcc gct tcc ttg gcc gtg ggc agc atg tgt gga gtg tat Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr 180 185 190			576
ggc tcc gcc ctc tgc aat gct cag cgc tgg ctc aac ttc caa gga gac Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp 195 200 205			624
aca ggg aat ggc ctg gct ccg ctg gat atc acc ttc cac ctc ttg gag Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu 210 215 220			672
cct ggc cag gcc cta ccg gat ggg atc cag cca ctg aat ggg aag atc Pro Gly Gln Ala Leu Pro Asp Gly Ile Gln Pro Leu Asn Gly Lys Ile 225 230 235 240			720
gca ccc tgc aac gag tct cag ggt gat gac tca gca gtc tgc tcc tgc Ala Pro Cys Asn Glu Ser Gln Gly Asp Asp Ser Ala Val Cys Ser Cys 245 250 255			768
cag gac tgt gcg gcg tcc tgc cct gtc atc cct ccg ccc gag gcc ttg Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Glu Ala Leu 260 265 270			816
cgc cct tcc ttc tac atg ggt cgc atg cca ggc tgg ctg gcc ctc atc Arg Pro Ser Phe Tyr Met Gly Arg Met Pro Gly Trp Leu Ala Leu Ile 275 280 285			864

atc atc ttc act gct gtc ttt gtg ttg ctc tct gca gtc ctt gtg cgt Ile Ile Phe Thr Ala Val Phe Val Leu Leu Ser Ala Val Leu Val Arg 290 295 300	912
ctc cga gtg gtt tcc aac agg aac aag aac aag gca gaa ggc ccc cag Leu Arg Val Val Ser Asn Arg Asn Lys Asn Lys Ala Glu Gly Pro Gln 305 310 315 320	960
gaa gcc ccc aaa ctc cct cat aag cac aaa ctc tca ccc cat acc atc Glu Ala Pro Lys Leu Pro His Lys His Lys Leu Ser Pro His Thr Ile 325 330 335	1008
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gcc ccc aag agc cag gcc cgg aaa gag aag tct ttc cat gat gag cat Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ser Phe His Asp Glu His 385 390 395 400	1200
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atc tcc ctc cag gac atc tgc tat gcc ccc ctc aac cca tat aac acc Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Tyr Asn Thr 465 470 475 480	1440
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gac tac ggg gct cct gtc ttc ccc ttc ctt gct gtt ggg gga tac caa Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln 545 550 555 560	1680
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gag gag gct ttc ttg aag gaa atg gaa tcc ttc cag agg aac aca agt Glu Glu Ala Phe Leu Lys Glu Met Glu Ser Phe Gln Arg Asn Thr Ser 595 600 605	1824
gac aag ttc cag gtt gcg ttc tca gct gag cgc tct ctg gag gat gag Asp Lys Phe Gln Val Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu 610 615 620	1872
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Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Leu Asp Phe	
770 775 780	
ctg ctc cag atg act gcc ttt gtg gcc ctg ctc tcc ctg gat agc aag	2400
Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys	
785 790 795 800	
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Lys Leu Pro Pro Pro Lys Glu Lys Glu Gly Leu Leu Leu Arg Phe Phe	
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Arg Lys Ile Tyr Ala Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val	
835 840 845	
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Val Met Leu Leu Phe Leu Thr Leu Phe Gly Ala Asn Leu Tyr Leu Met	
850 855 860	
tgc aac atc aac gtg ggg cta gac cag gag ctg gct ctg ccc aag gac	2640
Cys Asn Ile Asn Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp	
865 870 875 880	
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Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val	
885 890 895	
ggg cct cca gtg tac ttt gtc acc acc tcg ggc ttc aac ttc tcc agc	2736
Gly Pro Pro Val Tyr Phe Val Thr Thr Ser Gly Phe Asn Phe Ser Ser	
900 905 910	
gag gca ggc atg aac gcc act tgc tct agc gca ggc tgt aag agc ttc	2784
Glu Ala Gly Met Asn Ala Thr Cys Ser Ser Ala Gly Cys Lys Ser Phe	
915 920 925	
tcc cta acc cag aaa atc cag tat gcc agt gaa ttc cct gac cag tct	2832
Ser Leu Thr Gln Lys Ile Gln Tyr Ala Ser Glu Phe Pro Asp Gln Ser	
930 935 940	
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Tyr Val Ala Ile Ala Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp	
945 950 955 960	
ctg acc ccg tcc tcc tcc tgc tgt cgc ctt tat ata cgt ggc ccc cat	2928
Leu Thr Pro Ser Ser Ser Cys Cys Arg Leu Tyr Ile Arg Gly Pro His	
965 970 975	
aag gat gag ttc tgt ccc tca acg gat act tcc ttc aac tgc tta aaa	2976
Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys	
980 985 990	
aac tgc atg aac cgc act ctg ggt cct gtg agg ccc aca gcg gaa cag	3024
Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Ala Glu Gln	
995 1000 1005	
ttt cat aag tac ctg ccc tgg ttc ctg aat gat ccg ccc aat atc	3069
Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Pro Pro Asn Ile	

1010	1015	1020	
aga tgt ccc aaa ggg ggt cta gca gcg tat aga acg tct gtg aat			3114
Arg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Arg Thr Ser Val Asn			
1025	1030	1035	
ttg agc tca gat ggc cag gtt ata gcc tcc cag ttc atg gcc tac			3159
Leu Ser Ser Asp Gly Gln Val Ile Ala Ser Gln Phe Met Ala Tyr			
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cac aag ccc tta agg aac tca cag gac ttc aca gaa gct ctc cgg			3204
His Lys Pro Leu Arg Asn Ser Gln Asp Phe Thr Glu Ala Leu Arg			
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Ala Ser Arg Leu Leu Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys			
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Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile			
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tcc aac gtg ttc tac cag caa tac ctg acg gtc ctt cct gag gga			3339
Ser Asn Val Phe Tyr Gln Gln Tyr Leu Thr Val Leu Pro Glu Gly			
1100	1105	1110	
atc ttc acc ctt gct ctt tgc ttt gtg ccc acc ttt gtt gtc tgc			3384
Ile Phe Thr Leu Ala Leu Cys Phe Val Pro Thr Phe Val Val Cys			
1115	1120	1125	
tac ctc cta ctg ggc ctg gac atg tgc tca ggg atc ctc aac cta			3429
Tyr Leu Leu Leu Gly Leu Asp Met Cys Ser Gly Ile Leu Asn Leu			
1130	1135	1140	
ctc tcc atc att atg att ctc gtg gac acc att ggc ctc atg gct			3474
Leu Ser Ile Ile Met Ile Leu Val Asp Thr Ile Gly Leu Met Ala			
1145	1150	1155	
gtg tgg ggt atc agc tat aat gcg gta tcc ctc atc aac ctt gtc			3519
Val Trp Gly Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val			
1160	1165	1170	
acg gca gtg ggc atg tct gtg gag ttt gtg tcc cac atc act cgg			3564
Thr Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg			
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Ser Phe Ala Val Ser Thr Lys Pro Thr Arg Leu Glu Arg Ala Lys			
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gat gct act gtc ttc atg ggc agt gcg gtg ttt gct gga gtg gcc			3654
Asp Ala Thr Val Phe Met Gly Ser Ala Val Phe Ala Gly Val Ala			
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atg acc aac ttc cca ggc atc ctc atc ttg ggc ttt gcc caa gcc			3699
Met Thr Asn Phe Pro Gly Ile Leu Ile Leu Gly Phe Ala Gln Ala			
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cag ctt att cag atc ttc ttc ttc cgc ctc aac ctt ctg atc acc			3744
Gln Leu Ile Gln Ile Phe Phe Phe Arg Leu Asn Leu Leu Ile Thr			
1235	1240	1245	

ttg ctg ggt ctg ctg cat ggc ctg gtc ttc ctg ccg gtt gtc ctc	3789
Leu Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Val Leu	
1250 1255 1260	
agc tat ctg gga cca gat gtt aac caa gct ctg gta cag gag gag	3834
Ser Tyr Leu Gly Pro Asp Val Asn Gln Ala Leu Val Gln Glu Glu	
1265 1270 1275	
aaa cta gcc agc gag gca gca gtg gcc cca gag cct tct tgc cca	3879
Lys Leu Ala Ser Glu Ala Ala Val Ala Pro Glu Pro Ser Cys Pro	
1280 1285 1290	
cag tac ccc tcc cct gct gat gcg gat gcc aat gtt aac tac ggc	3924
Gln Tyr Pro Ser Pro Ala Asp Ala Asp Ala Asn Val Asn Tyr Gly	
1295 1300 1305	
ttt gcc cca gaa ctt gcc cac gga gct aat gct gct aga agc tct	3969
Phe Ala Pro Glu Leu Ala His Gly Ala Asn Ala Ala Arg Ser Ser	
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ttg ccc aaa agt gac caa aag ttc taa	3996
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<212> PRT

<213> Rattus sp.

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Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu
35 40 45

Thr Ser Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg His
50 55 60

Val Thr Gly Glu His Leu Ala Leu Leu Gln Arg Ile Cys Pro Arg Leu
65 70 75 80

Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu
85 90 95

Leu Ser Leu Glu Ser Ser Met Ser Ile Thr Lys Ala Leu Leu Thr Arg  
 100 105 110

Cys Pro Ala Cys Ser Asp Asn Phe Val Ser Leu His Cys His Asn Thr  
 115 120 125

Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Glu  
 130 135 140

Arg Gly Ala Gly Glu Pro Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
 145 150 155 160

Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Gln Val Arg  
 165 170 175

Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr  
 180 185 190

Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
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Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu  
 210 215 220

Pro Gly Gln Ala Leu Pro Asp Gly Ile Gln Pro Leu Asn Gly Lys Ile  
 225 230 235 240

Ala Pro Cys Asn Glu Ser Gln Gly Asp Asp Ser Ala Val Cys Ser Cys  
 245 250 255

Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Glu Ala Leu  
 260 265 270

Arg Pro Ser Phe Tyr Met Gly Arg Met Pro Gly Trp Leu Ala Leu Ile  
 275 280 285

Ile Ile Phe Thr Ala Val Phe Val Leu Leu Ser Ala Val Leu Val Arg  
 290 295 300

Leu Arg Val Val Ser Asn Arg Asn Lys Asn Lys Ala Glu Gly Pro Gln  
 305 310 315 320

Glu Ala Pro Lys Leu Pro His Lys His Lys Leu Ser Pro His Thr Ile  
 325 330 335



Leu Gly Arg Phe Phe Gln Asn Trp Gly Thr Arg Val Ala Ser Trp Pro  
 340 345 350

Leu Thr Val Leu Ala Leu Ser Phe Ile Val Val Ile Ala Leu Ala Ala  
 355 360 365

Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser  
 370 375 380

Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ser Phe His Asp Glu His  
 385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Arg Asn  
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Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Ser Lys Asn Phe  
 420 425 430

Ser Gly Ile Leu Ser Leu Asp Phe Leu Leu Glu Leu Leu Glu Leu Gln  
 435 440 445

Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Glu Arg Asn  
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Tyr Asn Thr  
 465 470 475 480

Ser Leu Ser Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn  
 485 490 495

Asn Arg Thr Leu Leu Met Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln  
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Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala  
 515 520 525

Pro Leu Thr Phe Lys Asp Gly Thr Ser Leu Ala Leu Ser Cys Met Ala  
 530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln  
 545 550 555 560

Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Leu  
 565 570 575

Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala Gln Ala Lys Leu Trp

580

585

590

Glu Glu Ala Phe Leu Lys Glu Met Glu Ser Phe Gln Arg Asn Thr Ser  
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Asp Lys Phe Gln Val Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu  
 610 615 620

Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Val Ser Tyr  
 625 630 635 640

Ile Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg  
 645 650 655

Cys Ser Arg Val Ala Val Glu Ser Lys Ala Thr Leu Gly Leu Gly Gly  
 660 665 670

Val Ile Val Val Leu Gly Ala Val Leu Ala Ala Met Gly Phe Tyr Ser  
 675 680 685

Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe  
 690 695 700

Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu  
 705 710 715 720

Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile  
 725 730 735

Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu  
 740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala  
 755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Leu Asp Phe  
 770 775 780

Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys  
 785 790 795 800

Arg Gln Glu Ala Ser Arg Pro Asp Val Leu Cys Cys Phe Ser Thr Arg  
 805 810 815

Lys Leu Pro Pro Pro Lys Glu Lys Glu Gly Leu Leu Leu Arg Phe Phe  
 820 825 830

Arg Lys Ile Tyr Ala Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val  
835 840 845

Val Met Leu Leu Phe Leu Thr Leu Phe Gly Ala Asn Leu Tyr Leu Met  
850 855 860

Cys Asn Ile Asn Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp  
865 870 875 880

Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val  
885 890 895

Gly Pro Pro Val Tyr Phe Val Thr Thr Ser Gly Phe Asn Phe Ser Ser  
900 905 910

Glu Ala Gly Met Asn Ala Thr Cys Ser Ser Ala Gly Cys Lys Ser Phe  
915 920 925

Ser Leu Thr Gln Lys Ile Gln Tyr Ala Ser Glu Phe Pro Asp Gln Ser  
930 935 940

Tyr Val Ala Ile Ala Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp  
945 950 955 960

Leu Thr Pro Ser Ser Ser Cys Cys Arg Leu Tyr Ile Arg Gly Pro His  
965 970 975

Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys  
980 985 990

Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Ala Glu Gln  
995 1000 1005

Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Pro Pro Asn Ile  
1010 1015 1020

Arg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Arg Thr Ser Val Asn  
1025 1030 1035

Leu Ser Ser Asp Gly Gln Val Ile Ala Ser Gln Phe Met Ala Tyr  
1040 1045 1050

His Lys Pro Leu Arg Asn Ser Gln Asp Phe Thr Glu Ala Leu Arg  
1055 1060 1065

Ala Ser	Arg Leu Leu Ala	Ala Asn Ile Thr	Ala Asp	Leu Arg Lys
1070		1075	1080	
Val Pro	Gly Thr Asp Pro	Asn Phe Glu Val Phe	Pro Tyr Thr Ile	
1085		1090	1095	
Ser Asn	Val Phe Tyr Gln Gln	Tyr Leu Thr Val	Leu Pro Glu Gly	
1100		1105	1110	
Ile Phe	Thr Leu Ala Leu Cys	Phe Val Pro Thr	Phe Val Val Cys	
1115		1120	1125	
Tyr Leu	Leu Leu Gly Leu Asp	Met Cys Ser Gly	Ile Leu Asn Leu	
1130		1135	1140	
Leu Ser	Ile Ile Met Ile Leu	Val Asp Thr Ile	Gly Leu Met Ala	
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Val Trp	Gly Ile Ser Tyr Asn	Ala Val Ser Leu	Ile Asn Leu Val	
1160		1165	1170	
Thr Ala	Val Gly Met Ser Val	Glu Phe Val Ser	His Ile Thr Arg	
1175		1180	1185	
Ser Phe	Ala Val Ser Thr Lys	Pro Thr Arg Leu	Glu Arg Ala Lys	
1190		1195	1200	
Asp Ala	Thr Val Phe Met Gly	Ser Ala Val Phe	Ala Gly Val Ala	
1205		1210	1215	
Met Thr	Asn Phe Pro Gly Ile	Leu Ile Leu Gly	Phe Ala Gln Ala	
1220		1225	1230	
Gln Leu	Ile Gln Ile Phe Phe	Phe Arg Leu Asn	Leu Leu Ile Thr	
1235		1240	1245	
Leu Leu	Gly Leu Leu His Gly	Leu Val Phe Leu	Pro Val Val Leu	
1250		1255	1260	
Ser Tyr	Leu Gly Pro Asp Val	Asn Gln Ala Leu	Val Gln Glu Glu	
1265		1270	1275	
Lys Leu	Ala Ser Glu Ala Ala	Val Ala Pro Glu	Pro Ser Cys Pro	
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Gln Tyr Pro Ser Pro Ala Asp Ala Asp Ala Asn Val Asn Tyr Gly  
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Leu Pro Lys Ser Asp Gln Lys Phe  
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<212> DNA

<213> Homo sapiens

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 1 5 10 15  
 cgc ttg gcc cag agt gag cct tac aca acc atc cac cag cct ggc tac 96  
 Arg Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr  
 20 25 30  
 tgc gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc 144  
 Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser  
 35 40 45  
 ctc atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg ccg gcc cgc 192  
 Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg  
 50 55 60  
 aag atc aca ggt gat cac ctg atc cta tta cag aag atc tgc ccc cgc 240  
 Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg  
 65 70 75 80  
 ctc tac acc ggc ccc aac acc caa gcc tgc tgc tcc gcc aag cag ctg 288  
 Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu  
 85 90 95  
 gta tca ctg gaa gcg agt ctg tcg atc acc aag gcc ctc ctc acc cgc 336  
 Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
 100 105 110

tgc cca gcc tgc tct gac aat ttt gtg aac ctg cac tgc cac aac acg Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr 115 120 125	384
tgc agc ccc aat cag agc ctc ttc atc aat gtg acc cgc gtg gcc cag Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln 130 135 140	432
cta ggg gct gga caa ctc cca gct gtg gtg gcc tat gag gcc ttc tac Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr 145 150 155 160	480
cag cat agc ttt gcc gag cag agc tat gac tcc tgc agc cgt gtg cgc Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg 165 170 175	528
gtc cct gca gct gcc acg ctg gct gtg ggc acc atg tgt ggc gtg tat Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr 180 185 190	576
ggc tct gcc ctt tgc aat gcc cag cgc tgg ctc aac ttc cag gga gac Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp 195 200 205	624
aca ggc aat ggt ctg gcc cca ctg gac atc acc ttc cac ctc ttg gag Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu 210 215 220	672
cct ggc cag gcc gtg ggg agt ggg att cag cct ctg aat gag ggg gtt Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val 225 230 235 240	720
gca cgt tgc aat gag tcc caa ggt gac gac gtg gcg acc tgc tcc tgc Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys 245 250 255	768
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ctt ggc cag ttc ttc cag ggc tgg ggc acg tgg gtg gct tcg tgg cct Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro 340 345 350	1056
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Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser	
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Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His	
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Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn	
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cgg tcc agc tac agg tat gac tct ctg ctg ctg ggg ccc aag aac ttc	1296
Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe	
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Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln	
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Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn	
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr	
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agt ctc tac gac tgc tgc atc aac agc ctc ctg cag tat ttc cag aac	1488
Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn	
485 490 495	
aac cgc acg ctc ctg ctg ctc aca gcc aac cag aca ctg atg ggg cag	1536
Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln	
500 505 510	
acc tcc caa gtc gac tgg aag gac cat ttt ctg tac tgt gcc aat gcc	1584
Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala	
515 520 525	
ccg ctc acc ttc aag gat ggc aca gcc ctg gcc ctg agc tgc atg gct	1632
Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala	
530 535 540	
gac tac ggg gcc cct gtc ttc ccc ttc ctt gcc att ggg ggg tac aaa	1680
Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys	
545 550 555 560	
gga aag gac tat tct gag gca gag gcc ctg atc atg acg ttc tcc ctc	1728
Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu	
565 570 575	
aac aat tac cct gcc ggg gac ccc cgt ctg gcc cag gcc aag ctg tgg	1776
Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp	
580 585 590	
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Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala	

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atc aat cgc acc aca gct gaa gac ctg ccc atc ttt gcc acc agc tac Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr 625 630 635 640			1920
att gtc ata ttc ctg tac atc tct ctg gcc ctg ggc agc tat tcc agc Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser 645 650 655			1968
tgg agc cga gtg atg gtg gac tcc aag gcc acg ctg ggc ctc ggc ggg Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly 660 665 670			2016
gtg gcc gtg gtc ctg gga gca gtc atg gct gcc atg ggc ttc ttc tcc Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser 675 680 685			2064
tac ttg ggt atc cgc tcc tcc ctg gtc atc ctg caa gtg gtt cct ttc Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe 690 695 700			2112
ctg gtg ctg tcc gtg ggg gct gat aac atc ttc atc ttt gtt ctc gag Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu 705 710 715 720			2160
tac cag agg ctg ccc cgg agg cct ggg gag cca cga gag gtc cac att Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile 725 730 735			2208
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tct gag gcc atc tgc ttc ttc cta ggg gcc ctg acc ccc atg cca gct Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala 755 760 765			2304
gtg cgg acc ttt gcc ctg acc tct ggc ctt gca gtg atc ctt gac ttc Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe 770 775 780			2352
ctc ctg cag atg tca gcc ttt gtg gcc ctg ctc tcc ctg gac agc aag Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys 785 790 795 800			2400
agg cag gag gcc tcc cgg ttg gac gtc tgc tgc tgt gtc aag ccc cag Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln 805 810 815			2448
gag ctg ccc ccg cct ggc cag gga gag ggg ctc ctg ctt ggc ttc ttc Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe 820 825 830			2496
caa aag gct tat gcc ccc ttc ctg ctg cac tgg atc act cga ggt gtt Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val 835 840 845			2544



gtg ctg ctg ctg ttt ctc gcc ctg ttc gga gtg agc ctc tac tcc atg Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met 850 855 860	2592
tgc cac atc agc gtg gga ctg gac cag gag ctg gcc ctg ccc aag gac Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp 865 870 875 880	2640
tcg tac ctg ctt gac tat ttc ctc ttt ctg aac cgc tac ttc gag gtg Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val 885 890 895	2688
ggg gcc ccg gtg tac ttt gtt acc acc ttg ggc tac aac ttc tcc agc Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser 900 905 910	2736
gag gct ggg atg aat gcc atc tgc tcc agt gca ggc tgc aac aac ttc Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe 915 920 925	2784
tcc ttc acc cag aag atc cag tat gcc aca gag ttc cct gag cag tct Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser 930 935 940	2832
tac ctg gcc atc cct gcc tcc tcc tgg gtg gat gac ttc att gac tgg Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp 945 950 955 960	2880
ctg acc ccg tcc tcc tgc tgc cgc ctt tat ata tct ggc ccc aat aag Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys 965 970 975	2928
gac aag ttc tgc ccc tcg acc gtc aac tct ctg aac tgc cta aag aac Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn 980 985 990	2976
tgc atg agc atc acg atg ggc tct gtg agg ccc tcg gtg gag cag ttc Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe 995 1000 1005	3024
cat aag tat ctt ccc tgg ttc ctg aac gac cgg ccc aac atc aaa His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys 1010 1015 1020	3069
tgt ccc aaa ggc ggc ctg gca gca tac agc acc tct gtg aac ttg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu 1025 1030 1035	3114
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Pro Gly Thr Asp Pro Ala Phe Glu Val Phe Pro Tyr Thr Ile Thr	
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aat gtg ttt tat gag cag tac ctg acc atc ctc cct gag ggg ctc	3339
Asn Val Phe Tyr Glu Gln Tyr Leu Thr Ile Leu Pro Glu Gly Leu	
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Phe Met Leu Ser Leu Cys Leu Val Pro Thr Phe Ala Val Ser Cys	
1115 1120 1125	
ctc ctg ctg ggc ctg gac ctg cgc tcc ggc ctc ctc aac ctg ctc	3429
Leu Leu Leu Gly Leu Asp Leu Arg Ser Gly Leu Leu Asn Leu Leu	
1130 1135 1140	
tcc att gtc atg atc ctc gtg gac act gtc ggc ttc atg gcc ctg	3474
Ser Ile Val Met Ile Leu Val Asp Thr Val Gly Phe Met Ala Leu	
1145 1150 1155	
tgg gac atc agt tac aat gct gtg tcc ctc atc aac ctg gtc tcg	3519
Trp Asp Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val Ser	
1160 1165 1170	
gcg gtg ggc atg tct gtg gag ttt gtg tcc cac att acc cgc tcc	3564
Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg Ser	
1175 1180 1185	
ttt gcc atc agc acc aag ccc acc tgg ctg gag agg gcc aaa gag	3609
Phe Ala Ile Ser Thr Lys Pro Thr Trp Leu Glu Arg Ala Lys Glu	
1190 1195 1200	
gcc acc atc tct atg gga agt gcg gtg ttt gca ggt gtg gcc atg	3654
Ala Thr Ile Ser Met Gly Ser Ala Val Phe Ala Gly Val Ala Met	
1205 1210 1215	
acc aac ctg cct ggc atc ctt gtc ctg ggc ctc gcc aag gcc cag	3699
Thr Asn Leu Pro Gly Ile Leu Val Leu Gly Leu Ala Lys Ala Gln	
1220 1225 1230	
ctc att cag atc ttc ttc ttc cgc ctc aac ctc ctg atc act ctg	3744
Leu Ile Gln Ile Phe Phe Phe Arg Leu Asn Leu Leu Ile Thr Leu	
1235 1240 1245	
ctg ggc ctg ctg cat ggc ttg gtc ttc ctg ccc gtc atc ctc agc	3789
Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Ile Leu Ser	
1250 1255 1260	
tac gtg ggg cct gac gtt aac ccg gct ctg gca ctg gag cag aag	3834
Tyr Val Gly Pro Asp Val Asn Pro Ala Leu Ala Leu Glu Gln Lys	
1265 1270 1275	
cgg gct gag gag gcg gtg gca gca gtc atg gtg gcc tct tgc cca	3879
Arg Ala Glu Glu Ala Val Ala Ala Val Met Val Ala Ser Cys Pro	
1280 1285 1290	
aat cac ccc tcc cga gtc tcc aca gct gac aac atc tat gtc aac	3924
Asn His Pro Ser Arg Val Ser Thr Ala Asp Asn Ile Tyr Val Asn	
1295 1300 1305	
cac agc ttt gaa ggt tct atc aaa ggt gct ggt gcc atc agc aac	3969

His Ser Phe Glu Gly Ser Ile Lys Gly Ala Gly Ala Ile Ser Asn  
 1310 1315 1320

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3999

<210> 4

<211> 1332

<212> PRT

<213> Homo sapiens

<400> 4

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 20 25 30

Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser  
 35 40 45

Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg  
 50 55 60

Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg  
 65 70 75 80

Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu  
 85 90 95

Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
 100 105 110

Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr  
 115 120 125

Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln  
 130 135 140

Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
 145 150 155 160

Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg

165	170	175
Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr		
180	185	190
Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp		
195	200	205
Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu		
210	215	220
Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val		
225	230	235
Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys		
245	250	255
Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu		
260	265	270
Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile		
275	280	285
Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly		
290	295	300
Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys		
305	310	315
Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu		
325	330	335
Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro		
340	345	350
Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala		
355	360	365
Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser		
370	375	380
Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His		
385	390	395
Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn		
405	410	415

Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe  
420 425 430

Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln  
435 440 445

Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn  
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr  
465 470 475 480

Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn  
485 490 495

Asn Arg Thr Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln  
500 505 510

Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala  
515 520 525

Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala  
530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys  
545 550 555 560

Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu  
565 570 575

Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp  
580 585 590

Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala  
595 600 605

Gly Met Phe Gln Val Thr Phe Thr Ala Glu Arg Ser Leu Glu Asp Glu  
610 615 620

Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr  
625 630 635 640

Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser  
645 650 655

Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly  
660 665 670

Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser  
675 680 685

Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe  
690 695 700

Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu  
705 710 715 720

Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile  
725 730 735

Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu  
740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala  
755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe  
770 775 780

Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys  
785 790 795 800

Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln  
805 810 815

Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe  
820 825 830

Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val  
835 840 845

Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met  
850 855 860

Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp  
865 870 875 880

Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val  
885 890 895

Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser  
 900 905 910

Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe  
 915 920 925

Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser  
 930 935 940

Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp  
 945 950 955 960

Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys  
 965 970 975

Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn  
 980 985 990

Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe  
 995 1000 1005

His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys  
 1010 1015 1020

Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu  
 1025 1030 1035

Thr Ser Asp Gly Gln Val Leu Ala Ser Arg Phe Met Ala Tyr His  
 1040 1045 1050

Lys Pro Leu Lys Asn Ser Gln Asp Tyr Thr Glu Ala Leu Arg Ala  
 1055 1060 1065

Ala Arg Glu Leu Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys Val  
 1070 1075 1080

Pro Gly Thr Asp Pro Ala Phe Glu Val Phe Pro Tyr Thr Ile Thr  
 1085 1090 1095

Asn Val Phe Tyr Glu Gln Tyr Leu Thr Ile Leu Pro Glu Gly Leu  
 1100 1105 1110

Phe Met Leu Ser Leu Cys Leu Val Pro Thr Phe Ala Val Ser Cys  
 1115 1120 1125

Leu Leu Leu Gly Leu Asp Leu Arg Ser Gly Leu Leu Asn Leu Leu

1130		1135		1140
Ser Ile Val Met Ile Leu Val Asp Thr Val Gly Phe Met Ala Leu				
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Trp Asp Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val Ser				
1160		1165		1170
Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg Ser				
1175		1180		1185
Phe Ala Ile Ser Thr Lys Pro Thr Trp Leu Glu Arg Ala Lys Glu				
1190		1195		1200
Ala Thr Ile Ser Met Gly Ser Ala Val Phe Ala Gly Val Ala Met				
1205		1210		1215
Thr Asn Leu Pro Gly Ile Leu Val Leu Gly Leu Ala Lys Ala Gln				
1220		1225		1230
Leu Ile Gln Ile Phe Phe Phe Arg Leu Asn Leu Leu Ile Thr Leu				
1235		1240		1245
Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Ile Leu Ser				
1250		1255		1260
Tyr Val Gly Pro Asp Val Asn Pro Ala Leu Ala Leu Glu Gln Lys				
1265		1270		1275
Arg Ala Glu Glu Ala Val Ala Ala Val Met Val Ala Ser Cys Pro				
1280		1285		1290
Asn His Pro Ser Arg Val Ser Thr Ala Asp Asn Ile Tyr Val Asn				
1295		1300		1305
His Ser Phe Glu Gly Ser Ile Lys Gly Ala Gly Ala Ile Ser Asn				
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Phe Leu Pro Asn Asn Gly Arg Gln Phe				
1325		1330		

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<211> 885

<212> DNA



<213> Rattus sp.

<400> 5

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<211> 458

<212> DNA

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<213> Rattus sp.

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<213> Rattus sp.

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<211> 4484

<212> DNA

<213> Rattus sp.

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<211> 3993

<212> DNA

<213> Rattus sp.

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gtngtnytnw sntayytngg nccngaygt n aaycargcny tngtncarga rgaraarytn	3840
gcnwsngarg cngcngtngc nccngarccn wsntgyccnc artayccnws nccngcngay	3900
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tcg gcc cag ggt gag ctc tac aca ccc act cac aaa gct ggc ttc tgc	96
Ser Ala Gln Gly Glu Leu Tyr Thr Pro Thr His Lys Ala Gly Phe Cys	
20 25 30	
acc ttt tat gaa gag tgt ggg aag aac cca gag ctt tct gga ggc ctc	144
Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu	
35 40 45	
aca tca cta tcc aat atc tcc tgc ttg tct aat acc cca gcc cgc cat	192
Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His	
50 55 60	
gtc aca ggt gac cac ctg gct ctt ctc cag cgc gtc tgt ccc cgc cta	240
Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu	
65 70 75 80	
tac aat ggc ccc aat gac acc tat gcc tgt tgc tct acc aag cag ctg	288
Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu	
85 90 95	
gtg tca tta gac agt agc ctg tct atc acc aag gcc ctc ctt aca cgc	336
Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg	
100 105 110	
tgc ccg gca tgc tct gaa aat ttt gtg agc ata cac tgt cat aat acc	384
Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr	
115 120 125	
tgc agc cct gac cag agc ctc ttc atc aat gtt act cgc gtg gtt cag	432
Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln	
130 135 140	
cgg gac cct gga cag ctt cct gct gtg gtg gcc tat gag gcc ttt tat	480
Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr	
145 150 155 160	
caa cgc agt ttt gca gag aag gcc tat gag tcc tgt agc cgg gtg cgc	528
Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg	
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Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr	
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp	
195 200 205	
aca ggg aat ggc ctg gct ccg ctg gac atc acc ttc cac ctc ttg gag	672
Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu	
210 215 220	

cct ggc cag gcc ctg gca gat ggg atg aag cca ctg gat ggg aag atc Pro Gly Gln Ala Leu Ala Asp Gly Met Lys Pro Leu Asp Gly Lys Ile 225 230 235 240	720
aca ccc tgc aat gag tcc cag ggt gaa gac tcg gca gcc tgt tcc tgc Thr Pro Cys Asn Glu Ser Gln Gly Glu Asp Ser Ala Ala Cys Ser Cys 245 250 255	768
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ctc cga gtg gct tcc aac agg aac aag aac aag aca gca ggc tcc cag Leu Arg Val Ala Ser Asn Arg Asn Lys Asn Lys Thr Ala Gly Ser Gln 305 310 315 320	960
gaa gcc ccc aac ctc cct cgt aag cgc aga ttc tca cct cac act gtc Glu Ala Pro Asn Leu Pro Arg Lys Arg Arg Phe Ser Pro His Thr Val 325 330 335	1008
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gcc cct aaa agc caa gcc cgg aaa gaa aag gct ttc cat gac gag cat Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ala Phe His Asp Glu His 385 390 395 400	1200
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agg tcc agc tac aag tac gac tcc ctg ctg cta ggg ccc aag aac ttc Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe 420 425 430	1296
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atc tcc ctc cag gac atc tgc tat gct ccc ctc aac ccg cat aac acc	1440

Ile Ser Leu Gln Asp	Ile Cys Tyr Ala Pro Leu Asn Pro His Asn Thr	
465	470	475 480
agc ctc act gac tgc tgt gtc aac agc ctc ctt caa tac ttc cag aac		1488
Ser Leu Thr Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn		
	485 490 495	
aac cac aca ctc ctg ctg ctc aca gcc aat cag act ctg aat ggc cag		1536
Asn His Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln		
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acc tcc ctg gtg gac tgg aag gac cat ttc ctc tac tgt gcc aat gcc		1584
Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala		
	515 520 525	
cct ctc acg tac aaa gat ggc aca gcc ctg gcc ctg agc tgc ata gct		1632
Pro Leu Thr Tyr Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Ile Ala		
	530 535 540	
gac tac ggg gca cct gtc ttc ccc ttc ctt gct gtt ggg ggc tac caa		1680
Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln		
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Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Ile		
	565 570 575	
aat aac tac ccc gct gat gat ccc cgc atg gcc cac gcc aag ctc tgg		1776
Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala His Ala Lys Leu Trp		
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Glu Glu Ala Phe Leu Lys Glu Met Gln Ser Phe Gln Arg Ser Thr Ala		
	595 600 605	
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Asp Lys Phe Gln Ile Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu		
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atc aat cgc act acc atc cag gac ctg cct gtc ttt gcc atc agc tac		1920
Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Ile Ser Tyr		
	625 630 635 640	
ctt atc gtc ttc ctg tac atc tcc ctg gcc ctg ggc agc tac tcc aga		1968
Leu Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg		
	645 650 655	
tgg agc cga gtt gcg gtg gat tcc aag gct act ctg ggc cta ggt ggg		2016
Trp Ser Arg Val Ala Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly		
	660 665 670	
gtg gct gtt gtg ctg gga gca gtc gtc gct gcc atg ggc ttc tac tcc		2064
Val Ala Val Val Leu Gly Ala Val Val Ala Ala Met Gly Phe Tyr Ser		
	675 680 685	
tac ctg ggt gtc ccc tcc tct ctg gtc atc att caa gtg gta cct ttc		2112
Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe		
	690 695 700	
ctg gtg ctg gct gtg gga gct gac aac atc ttc atc ttt gtt ctt gag		2160
Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu		

705	710	715	720	
tac cag agg ctg cct agg atg ccc ggg gag cag cga gag gct cac att				2208
Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile	725	730	735	
ggc cgc acc ctg ggt agt gtg gcc ccc agc atg ctg ctg tgc agc ctc				2256
Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu	740	745	750	
tct gag gcc atc tgc ttc ttt cta ggg gcc ctg acc tcc atg cca gct				2304
Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Ser Met Pro Ala	755	760	765	
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Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Phe Asp Phe	770	775	780	
ctg ctc cag atg aca gcc ttt gtg gcc ctg ctc tcc ctg gat agc aag				2400
Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys	785	790	800	
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Arg Gln Glu Ala Ser Arg Pro Asp Val Val Cys Cys Phe Ser Ser Arg	805	810	815	
aat ctg ccc cca ccg aaa caa aaa gaa ggc ctc tta ctt tgc ttc ttc				2496
Asn Leu Pro Pro Pro Lys Gln Lys Glu Gly Leu Leu Leu Cys Phe Phe	820	825	830	
cgc aag ata tac act ccc ttc ctg ctg cac aga ttc atc cgc cct gtt				2544
Arg Lys Ile Tyr Thr Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val	835	840	845	
gtg ctg ctg ctc ttt ctg gtc ctg ttt gga gca aac ctc tac tta atg				2592
Val Leu Leu Leu Phe Leu Val Leu Phe Gly Ala Asn Leu Tyr Leu Met	850	855	860	
tgc aac atc agc gtg ggg ctg gac cag gat ctg gct ctg ccc aag gat				2640
Cys Asn Ile Ser Val Gly Leu Asp Gln Asp Leu Ala Leu Pro Lys Asp	865	870	875	880
tcc tac ctg ata gac tac ttc ctc ttt ctg aac cgg tac ttg gaa gtg				2688
Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val	885	890	895	
ggg cct cca gtg tac ttt gac acc acc tca ggc tac aac ttt tcc acc				2736
Gly Pro Pro Val Tyr Phe Asp Thr Thr Ser Gly Tyr Asn Phe Ser Thr	900	905	910	
gag gca ggc atg aac gcc att tgc tct agt gca ggc tgt gag agc ttc				2784
Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Glu Ser Phe	915	920	925	
tcc cta acc cag aaa atc cag tat gcc agt gaa ttc cct aat cag tct				2832
Ser Leu Thr Gln Lys Ile Gln Tyr Ala Ser Glu Phe Pro Asn Gln Ser	930	935	940	
tat gtg gct att gct gca tcc tcc tgg gta gat gac ttc atc gac tgg				2880
Tyr Val Ala Ile Ala Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp	945	950	955	960

ctg acc cca tcc tcc tcc tgc tgc cgc att tat acc cgt ggc ccc cat	2928
Leu Thr Pro Ser Ser Ser Cys Cys Arg Ile Tyr Thr Arg Gly Pro His	
965 970 975	
aaa gat gag ttc tgt ccc tca acg gat act tcc ttc aac tgt ctc aaa	2976
Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys	
980 985 990	
aac tgc atg aac cgc act ctg ggt ccc gtg aga ccc aca aca gaa cag	3024
Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Thr Glu Gln	
995 1000 1005	
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Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Thr Pro Asn Ile	
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aga tgt cct aaa ggg ggc cta gca gcg tat aga acc tct gtg aat	3114
Arg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Arg Thr Ser Val Asn	
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Leu Ser Ser Asp Gly Gln Ile Ile Ala Ser Gln Phe Met Ala Tyr	
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His Lys Pro Leu Arg Asn Ser Gln Asp Phe Thr Glu Ala Leu Arg	
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Ala Ser Arg Leu Leu Ala Ala Asn Ile Thr Ala Glu Leu Arg Lys	
1070 1075 1080	
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Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile	
1085 1090 1095	
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Ser Asn Val Phe Tyr Gln Gln Tyr Leu Thr Val Leu Pro Glu Gly	
1100 1105 1110	
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Ile Phe Thr Leu Ala Leu Cys Phe Val Pro Thr Phe Val Val Cys	
1115 1120 1125	
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Tyr Leu Leu Leu Gly Leu Asp Ile Arg Ser Gly Ile Leu Asn Leu	
1130 1135 1140	
ctc tcc atc att atg atc ctc gtg gac acc atc ggc ctc atg gct	3474
Leu Ser Ile Ile Met Ile Leu Val Asp Thr Ile Gly Leu Met Ala	
1145 1150 1155	
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Val Trp Gly Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val	
1160 1165 1170	
acg gca gtg ggc atg tct gtg gag ttc gtg tcc cac att acc cgg	3564
Thr Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg	
1175 1180 1185	

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Ser Phe	Ala Val Ser Thr Lys	Pro Thr Arg Leu Glu	Arg Ala Lys	
1190	1195	1200		
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Asp Ala	Thr Ile Phe Met Gly	Ser Ala Val Phe Ala	Gly Val Ala	
1205	1210	1215		
atg acc	aac ttc ccg ggc atc	ctc atc ctg ggc ttt	gct cag gcc	3699
Met Thr	Asn Phe Pro Gly Ile	Leu Ile Leu Gly Phe	Ala Gln Ala	
1220	1225	1230		
cag ctt	atc cag att ttc ttc	ttc cgc ctc aac ctc	ctg atc acc	3744
Gln Leu	Ile Gln Ile Phe Phe	Phe Arg Leu Asn Leu	Leu Ile Thr	
1235	1240	1245		
ttg ctg	ggg ctg cta cac ggc	ctg gtc ttc ctg ccc	gtt gtc ctc	3789
Leu Leu	Gly Leu Leu His Gly	Leu Val Phe Leu Pro	Val Val Leu	
1250	1255	1260		
agc tat	ctg ggg cca gat gtt	aac caa gct ctg gta	ctg gag gag	3834
Ser Tyr	Leu Gly Pro Asp Val	Asn Gln Ala Leu Val	Leu Glu Glu	
1265	1270	1275		
aaa cta	gcc act gag gca gcc	atg gtc tca gag cct	tct tgc cca	3879
Lys Leu	Ala Thr Glu Ala Ala	Met Val Ser Glu Pro	Ser Cys Pro	
1280	1285	1290		
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Gln Tyr	Pro Phe Pro Ala Asp	Ala Asn Thr Ser Asp	Tyr Val Asn	
1295	1300	1305		
tac ggc	ttt aat cca gaa ttt	atc cct gaa att aat	gct gct agc	3969
Tyr Gly	Phe Asn Pro Glu Phe	Ile Pro Glu Ile Asn	Ala Ala Ser	
1310	1315	1320		
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		20						25					30		

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Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His  
50 55 60

Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu  
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Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu  
85 90 95

Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
100 105 110

Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr  
115 120 125

Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln  
130 135 140

Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
145 150 155 160

Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg  
165 170 175

Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr  
180 185 190

Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
195 200 205

Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu  
210 215 220

Pro Gly Gln Ala Leu Ala Asp Gly Met Lys Pro Leu Asp Gly Lys Ile  
225 230 235 240

Thr Pro Cys Asn Glu Ser Gln Gly Glu Asp Ser Ala Ala Cys Ser Cys  
245 250 255

Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Pro Ala Leu  
260 265 270

Arg Pro Ser Phe Tyr Met Gly Arg Met Pro Gly Trp Leu Ala Leu Ile



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Leu Arg Val Ala Ser Asn Arg Asn Lys Asn Lys Thr Ala Gly Ser Gln		
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Glu Ala Pro Asn Leu Pro Arg Lys Arg Arg Phe Ser Pro His Thr Val		
	325	330 335
Leu Gly Arg Phe Phe Glu Ser Trp Gly Thr Arg Val Ala Ser Trp Pro		
	340	345 350
Leu Thr Val Leu Ala Leu Ser Phe Ile Val Val Ile Ala Leu Ser Val		
	355	360 365
Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser		
	370	375 380
Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ala Phe His Asp Glu His		
385	390	395 400
Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Lys Asn		
	405	410 415
Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe		
	420	425 430
Ser Gly Ile Leu Ser Leu Asp Leu Leu Gln Glu Leu Leu Glu Leu Gln		
	435	440 445
Glu Arg Leu Arg His Leu Gln Val Trp Ser His Glu Ala Gln Arg Asn		
	450	455 460
Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro His Asn Thr		
465	470	475 480
Ser Leu Thr Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn		
	485	490 495
Asn His Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln		
	500	505 510
Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala		
	515	520 525

Pro Leu Thr Tyr Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Ile Ala  
530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln  
545 550 555 560

Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Ile  
565 570 575

Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala His Ala Lys Leu Trp  
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Glu Glu Ala Phe Leu Lys Glu Met Gln Ser Phe Gln Arg Ser Thr Ala  
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Asp Lys Phe Gln Ile Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu  
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Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Ile Ser Tyr  
625 630 635 640

Leu Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg  
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Trp Ser Arg Val Ala Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly  
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Val Ala Val Val Leu Gly Ala Val Val Ala Ala Met Gly Phe Tyr Ser  
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Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe  
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Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu  
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Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile  
725 730 735

Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu  
740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Ser Met Pro Ala  
755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Phe Asp Phe  
770 775 780

Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys  
785 790 795 800

Arg Gln Glu Ala Ser Arg Pro Asp Val Val Cys Cys Phe Ser Ser Arg  
805 810 815

Asn Leu Pro Pro Pro Lys Gln Lys Glu Gly Leu Leu Leu Cys Phe Phe  
820 825 830

Arg Lys Ile Tyr Thr Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val  
835 840 845

Val Leu Leu Leu Phe Leu Val Leu Phe Gly Ala Asn Leu Tyr Leu Met  
850 855 860

Cys Asn Ile Ser Val Gly Leu Asp Gln Asp Leu Ala Leu Pro Lys Asp  
865 870 875 880

Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val  
885 890 895

Gly Pro Pro Val Tyr Phe Asp Thr Thr Ser Gly Tyr Asn Phe Ser Thr  
900 905 910

Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Glu Ser Phe  
915 920 925

Ser Leu Thr Gln Lys Ile Gln Tyr Ala Ser Glu Phe Pro Asn Gln Ser  
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965 970 975

Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys  
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Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Thr Glu Gln  
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Lys Leu Ala Thr Glu Ala Ala Met Val Ser Glu Pro Ser Cys Pro				
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Gln Tyr Pro Phe Pro Ala Asp Ala Asn Thr Ser Asp Tyr Val Asn				
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Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr Cys	
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Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg Lys	
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Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg Leu	
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Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu Val	
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Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg Cys	
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Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr Cys	
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His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg Val	
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Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp Thr	
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Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu Asp	
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Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile Ile	
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Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly Phe	
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Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala Gly	
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Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser Ala	
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Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His Phe	
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Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn Arg	
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Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln Glu	
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Leu	Tyr	Asp	Cys	Cys	Ile	Asn	Ser	Leu	Leu	Gln	Tyr	Phe	Gln	Asn	Asn	
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Arg	Thr	Leu	Leu	Leu	Leu	Thr	Ala	Asn	Gln	Thr	Leu	Met	Gly	Gln	Thr	
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Ser	Gln	Val	Asp	Trp	Lys	Asp	His	Phe	Leu	Tyr	Cys	Ala	Asn	Ala	Pro	
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ctc	acc	ttc	aag	gat	ggc	aca	gcc	ctg	gcc	ctg	agc	tgc	atg	gct	gac	1691
Leu	Thr	Phe	Lys	Asp	Gly	Thr	Ala	Leu	Ala	Leu	Ser	Cys	Met	Ala	Asp	
530					535				540					545		
tac	ggg	gcc	cct	gtc	ttc	ccc	ttc	ctt	gcc	att	ggg	ggg	tac	aaa	gga	1739
Tyr	Gly	Ala	Pro	Val	Phe	Pro	Phe	Leu	Ala	Ile	Gly	Gly	Tyr	Lys	Gly	
				550					555					560		
aag	gac	tat	tct	gag	gca	gag	gcc	ctg	atc	atg	acg	ttc	tcc	ctc	aac	1787
Lys	Asp	Tyr	Ser	Glu	Ala	Glu	Ala	Leu	Ile	Met	Thr	Phe	Ser	Leu	Asn	
			565					570					575			
aat	tac	cct	gcc	ggg	gac	ccc	cgt	ctg	gcc	cag	gcc	aag	ctg	tgg	gag	1835
Asn	Tyr	Pro	Ala	Gly	Asp	Pro	Arg	Leu	Ala	Gln	Ala	Lys	Leu	Trp	Glu	
		580					585					590				
gag	gcc	ttc	tta	gag	gaa	atg	cga	gcc	ttc	cag	cgt	cgg	atg	gct	ggc	1883
Glu	Ala	Phe	Leu	Glu	Glu	Met	Arg	Ala	Phe	Gln	Arg	Arg	Met	Ala	Gly	
	595					600				605						
atg	ttc	cag	gtc	acg	ttc	atg	gct	gag	cgc	tct	ctg	gaa	gac	gag	atc	1931
Met	Phe	Gln	Val	Thr	Phe	Met	Ala	Glu	Arg	Ser	Leu	Glu	Asp	Glu	Ile	
610					615				620					625		
aat	cgc	acc	aca	gct	gaa	gac	ctg	ccc	atc	ttt	gcc	acc	agc	tac	att	1979
Asn	Arg	Thr	Thr	Ala	Glu	Asp	Leu	Pro	Ile	Phe	Ala	Thr	Ser	Tyr	Ile	
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gtc	ata	ttc	ctg	tac	atc	tct	ctg	gcc	ctg	ggc	agc	tat	tcc	agc	tgg	2027
Val	Ile	Phe	Leu	Tyr	Ile	Ser	Leu	Ala	Leu	Gly	Ser	Tyr	Ser	Ser	Trp	
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agc	cga	gtg	atg	gtg	gac	tcc	aag	gcc	acg	ctg	ggc	ctc	ggc	ggg	gtg	2075
Ser	Arg	Val	Met	Val	Asp	Ser	Lys	Ala	Thr	Leu	Gly	Leu	Gly	Gly	Val	
		660					665					670				
gcc	gtg	gtc	ctg	gga	gca	gtc	atg	gct	gcc	atg	ggc	ttc	ttc	tcc	tac	2123
Ala	Val	Val	Leu	Gly	Ala	Val	Met	Ala	Ala	Met	Gly	Phe	Phe	Ser	Tyr	
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ttg	ggt	atc	cgc	tcc	tcc	ctg	gtc	atc	ctg	caa	gtg	gtt	cct	ttc	ctg	2171
Leu	Gly	Ile	Arg	Ser	Ser	Leu	Val	Ile	Leu	Gln	Val	Val	Pro	Phe	Leu	

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cag agg ctg ccc cgg agg cct ggg gag cca cga gag gtc cac att ggg	Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile Gly	2267		
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cga gcc cta ggc agg gtg gct ccc agc atg ctg ttg tgc agc ctc tct	Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu Ser	2315		
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gag gcc atc tgc ttc ttc cta ggg gcc ctg acc ccc atg cca gct gtg	Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala Val	2363		
755	760	765		
cgg acc ttt gcc ctg acc tct ggc ctt gca gtg atc ctt gac ttc ctc	Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe Leu	2411		
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ctg cag atg tca gcc ttt gtg gcc ctg ctc tcc ctg gac agc aag agg	Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys Arg	2459		
790	795	800		
cag gag gcc tcc cgg ttg gac gtc tgc tgc tgt gtc aag ccc cag gag	Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln Glu	2507		
805	810	815		
ctg ccc ccg cct ggc cag gga gag ggg ctc ctg ctt ggc ttc ttc caa	Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe Gln	2555		
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835	840	845		
ctg ctg ctg ttt ctc gcc ctg ttc gga gtg agc ctc tac tcc atg tgc	Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met Cys	2651		
850	855	860	865	
cac atc agc gtg gga ctg gac cag gag ctg gcc ctg ccc aag gac tcg	His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp Ser	2699		
870	875	880		
tac ctg ctt gac tat ttc ctc ttt ctg aac cgc tac ttc gag gtg ggg	Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val Gly	2747		
885	890	895		
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900	905	910		
gct ggg atg aat gcc atc tgc tcc agt gca ggc tgc aac aac ttc tcc	Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe Ser	2843		
915	920	925		
ttc acc cag aag atc cag tat gcc aca gag ttc cct gag cag tct tac	Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser Tyr	2891		
930	935	940	945	

ctg gcc atc cct gcc tcc tcc tgg gtg gat gac ttc att gac tgg ctg Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp Leu 950 955 960	2939
acc ccg tcc tcc tgc tgc cgc ctt tat ata tct ggc ccc aat aag gac Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys Asp 965 970 975	2987
aag ttc tgc ccc tcg acc gtc aac tct ctg aac tgc cta aag aac tgc Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn Cys 980 985 990	3035
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ccc aaa ggc ggc ctg gca gca tac agc acc tct gtg aac ttg act Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu Thr 1025 1030 1035	3173
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ctg gat tca gcc tcc agg ttc atg gcc tat cac aag ccc ctg aaa Leu Asp Ser Ala Ser Arg Phe Met Ala Tyr His Lys Pro Leu Lys 1070 1075 1080	3308
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gag cag tac ctg acc atc ctc cct gag ggg ctc ttc atg ctc agc Glu Gln Tyr Leu Thr Ile Leu Pro Glu Gly Leu Phe Met Leu Ser 1130 1135 1140	3488
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Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser  
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Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg  
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Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg  
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Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu  
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Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg

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Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile		
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Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly		
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Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys		
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Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu		
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Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro		
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Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala  
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Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn  
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Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe  
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Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln  
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Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala  
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Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys  
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Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu  
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Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp  
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Gly Met Phe Gln Val Thr Phe Met Ala Glu Arg Ser Leu Glu Asp Glu  
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Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr  
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Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser  
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Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly  
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Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser  
675 680 685

Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe  
690 695 700

Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu  
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Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile  
725 730 735

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Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala  
755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe  
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Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln  
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Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe  
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Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val  
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Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met  
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Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp  
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Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val  
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Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn  
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Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe  
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His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys  
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Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu  
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Thr Ser Asp Gly Gln Val Leu Asp Thr Val Ala Ile Leu Ser Pro  
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Arg Leu Glu Tyr Ser Gly Thr Ile Ser Ala His Cys Asn Leu Tyr  
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Leu Leu Asp Ser Ala Ser Arg Phe Met Ala Tyr His Lys Pro Leu

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Lys Asn Ser Gln Asp Tyr Thr 1085	Glu Ala Leu Arg 1090	Ala Ala Arg Glu 1095
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